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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/544,762	04/07/2000	Shannon Mary Nelson	NORTH-390A/A-2241	9968
7590	12/17/2004		EXAMINER	
Terry J Anderson Esq Northrop Grumman Corporation 1840 Century Park East Los Angeles, CA 92677-2199			SEDIGHIAN, REZA	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 12/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/544,762

Applicant(s)

NELSON ET AL.

Examiner

M. R. Sedighian

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-13,15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,8-13,15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

1. This communication is responsive to applicant's 9/23/2004 amendments in the application of Shannon Mary Nelson et al. for "Rugged shock resistant backplane for embedded systems" filed 4/7/2000. The amendments have been entered. Claims 1-6, 8-13, and 15-16 are now pending.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 6, 8-9, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and in further view of William (US patent No: 3,858,154).

Regarding claims 1, 8, and 15, Ahmad discloses a shock-resistant system (10, fig. 1 and 32, fig. 4) for interconnecting circuit cards (14g, 14h, fig. 1 and 34, fig. 4) to enable data to be transmitted and received therebetween (col. 3, lines 40-42, col. 5, lines 24-27), comprising: a common backplane (12, fig. 1 and 38, fig. 4) having a plurality of circuit card connectors (col. 3, lines 53-59 and 15, fig. 2) disposed in spaced apart relation thereon for supporting circuit cards in a generally upright parallel relationship (chips 14a-i are arranged in a parallel relationship with respect to each other); a plurality of circuit cards (14g, 14h, fig. 1 and 34, 36, fig. 4) each being mounted to one of the circuit card connectors (col. 3, lines 55-58) and having a transmitter LED (20a, fig. 3A) and a receiver photodiode formed thereon (22b, fig. 3A); a plurality of optical pathways (25, fig. 2 and 24, fig. 3A) formed solely through air between the circuit cards (col. 4,

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lines 10-15), the optical pathways forming a plurality of independent optical connections (note that there are a plurality of optical path ways 24 between transmitters 20a, 20c, 20e of circuit card 14g and the optical receivers 22a, 22c, 22e of the circuit card 14h) between the transmitter LED (20a, fig. 3A) on at least one of the circuit cards (14g, fig. 3A) and the receiver photodiode (22a, fig. 4) on the other circuit cards (14h, fig. 3A and col. 4, lines 15-20); and wherein the circuit cards (14g, 14h, fig. 3A) are maintained in fixed relationship to one another via the common backplane (12, fig. 3A) to maintain continuous optical intercard communications between each of the circuit cards such that the LED on each circuit card is operative to generate and transmit a signal and the photodiode of one corresponding circuit card is operative to receive the signal through the corresponding optical pathway (col. 4, lines 15-21). Ahmad differs from the claimed invention in that Ahmad does not specifically disclose the interconnected circuit cards are within a computer system. Davidson teaches the interconnection of optical circuit cards (100, 104, fig. 8) within a computer system (col. 12, lines 14-28). One of the ordinary skill in the art would have been motivated to incorporate a plurality of interconnected optical circuit cards within a computer system to provide a high speed data communication between the elements of the computer system. As it is taught by Davidson, it would have been obvious to an artisan at the time of invention to incorporate a plurality of interconnected optical circuit cards such as the ones of Ahmad within a computer system to provide a high speed optical data communication between the sub-system elements within a computer to increase the bandwidth. The modified optical data transmission system of Ahmad and Davidson differs from the claimed invention in that Ahmad and Davidson do not specifically disclose circuit cards are extended normal to a back plane. William teaches a common backplane having a plurality of circuit cards

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connectors disposed in spaced apart relationship for supporting circuit cards extending normal to the backplane (col. 1, lines 21-31 and figs. 1, 6). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide a supporting structure, wherein circuit cards are extended normal to a backplane, as it is taught by William, for the circuit cards and the backplane, in the modified optical data transmission system of Ahmad and Davidson in order to transmit the optical signals at a plurality of different paths and different directions. As to claims 8 and 15, Ahmad further teaches generating and transmitting a light from at least one of the LED diode (for example, transmitter 20a in fig. 3A) and receiving the light by the photodiode formed on any of the circuit cards (for example, by receiver 22a that can be considered as a photodiode that is formed on any one of the circuit cards such as circuit card 14h) to receive the data carried by the light (col. 4, lines 4-17).

Regarding claims 2 and 9, Ahmad discloses optically transmitted infrared radiation (col. 3, line 25-27).

Regarding claims 6 and 13, Ahmad discloses the first and second circuit cards are operative to run an embedded application (col. 5, lines 30-33).

4. Claims 3-4 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and in view of William (US patent No: 3,858,154) and in further view of Croft et al. (US Patent No: 5,864,708).

Regarding claims 3-4 and 10-11, the combination of Ahmad, Davidson, and William differs from the claimed invention in that Ahmad, Davidson, and William do not specifically

disclose the transmission and reception signals comprise a standardized infrared communication scheme protocol that is developed by the infrared data association. Croft discloses wireless transceivers (63, 64, fig. 1) that communicate with each other by using Infrared Data Association standards (col. 3, lines 5-14). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate Infrared Data Association standards or protocols such as the one discussed by Croft for the optical data transmission and reception in the modified optical communication systems of Ahmad, Davidson, and William in order to provide a reliable method of data transmission by implementing a standard Infrared protocol to detect transmission errors and to avoid collisions.

5. Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and William (US patent No: 3,858,154) and in further view of Barina (US Patent No: 4,829,596).

Regarding claims 5 and 12, the combination of Ahmad, Davidson, and William differs from the claimed invention in that Ahmad, Davidson, and William do not disclose the first and second circuit cards are housed within an enclosure. Barina discloses a housing (12, fig. 1) which includes a series of slots that receive a plurality of circuit boards (16-18, fig. 1) that are connected to a mother board which extends along the back surface of the housing to a backplane (col. 2, lines 55-61 and 11, fig. 1). It is inherent that electrical or optical components are housed within a housing for the reason of safety and protection, and it would have been obvious to provide an enclosure such as the one Barina for the optical circuit cards in the modified optical

communication system of Ahmad, Davidson, and William in order to protect it's components and to provide safety for the users.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahmad et al. (US patent No: 5,818,984) in view of Davidson (US patent No: 6,160,653) and William (US patent No: 3,858,154) and in further view of Cargin, Jr. et al. (US Patent No: 6,023,147).

Regarding claim 16, the combination of Ahmad, Davidson, and William differs from the claimed invention in that Ahmad, Davidson, and William do not disclose the computer system includes a hand-held data collection device. Cargin discloses a hand-held data collection device (col. 3, lines 55-60 and 10, fig. 1) that includes a plurality of circuit cards (col. 10, lines 22-29). Therefore, it would have been obvious to an artisan at the time of invention to incorporate a plurality of interconnected optical circuit cards such as the ones of Ahmad within a computer system such as of Davidson, or within a data collection device such as of Cargin to provide a high speed optical data transmission between sub-system elements of the computer system to increase the bandwidth.

7. Applicant's arguments filed 9/23/2004 have been fully considered but they are not persuasive.

Remark states Ahmad teaches only the use of chips, or integrated circuits, and does not appear to teach the use of circuit cards. However, a chip, or an integrated circuit can be considered as a circuit card, or it can be imposed on a circuit card, as such concept is taught by references of Estrada et al. (US Patent No: 5,611,022, see col. 4, lines 32-35) and Reichardt et al.

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(US Patent No: 5,269,707, see col. 1, lines 19-20). Remark further states Ahmad does not teach an upright relationship between chips, or circuit cards. Ahmad in figs. 2 and 3A teaches two chip 14g and 14h that are positioned on a substrate 12, and it appears the two chip are positioned in an upright relationship to each other to transmit and receive optical signals 24 through free space 25. Furthermore, positioning the chips 14, or circuit cards 14, in an upright position is merely a matter of design choice, and it would have been obvious to a person of ordinary skill in the art that such chips can be positioned in an upright relationship to each other in order to provide a specific bi-directional transmission. Remark further states Ahmad teaches away that a plurality of circuit cards each being mounted to one of circuit card connectors. Ahmad teaches the chips are connected to substrate 12 through pins 15, and pins 15 maybe formed with controlled collapse chip connections, conductive adhesive bumps, or other pinless connectors (col. 3, lines 55-59). The collection of pins 15 that are used to connect a chip 14 to substrate 12 can be considered as the circuit card connector. Accordingly, for each chip 14 there is a collection of pins 15 that can make the circuit card connector for that chip to be connected to substrate 12. Therefore, it would have been obvious that chips 14a-i, each can be mounted to respective circuit card connectors such that the connection to substrate 12 can be made possible. Remark further states Ahmad, William, and Davidson fail to disclose a shock-resistant system. However, it is obvious and it is well known that electrical or optical components can be housed within a shock-resistant housing for reasons of safety and protection, as such enclosures are well known, and as it is taught by Barina. Applicant's attention is directed that during the prosecution of a pending patent application the terms found in the claims should be given the broadest reasonable interpretation, *See in re Pearson*, 181 USPQ 641 (CCPA 1974).

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should be given the broadest reasonable interpretation, *See in re Pearson*, 181 USPQ 641 (CCPA 1974).

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

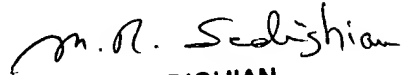
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


M. R. SEDIGHIAN
PRIMARY EXAMINER